Impact of Housing on Students' Performance: An Empirical Analysis

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Abstract

This paper is an attempt to examine the impact of students' housing on their academic performance. Data for the study was collected through a survey on purposively selected 100 respondents; 50 non-resident students from Jagannath University and 50 resident students from Jahangirnagar University. Descriptive statistics and linear regression model are used for data analysis. The study reveals that resident students have better academic performance than non-resident students. This may be attributed to low living cost, access to campus resources, less financial pressure, more interaction with faculties and peers, and proximity to campus. The results indicate that students' housing has a significant positive impact on their academic performance.

Key Words : Housing, students, performance, academic achievement, impact, extra-curricular activities, resident, non-resident, off-campus, survey, regression.

1.1 Introduction

At the tertiary level of education, housing plays a critical role in a student's social life. Many of these students have to stay away from their family for a long period of time for education purposes. This is an enduring experience for young students as many of them leave their family for the first time for such long and have to learn how to live an independent life, compromising with range of issues emanating from sharing room and other facilities. Students feel more comfortable in residence hall and can have better academic performance as residence halls generally have positive impact on success, retention rates and satisfaction of students at the tertiary institutions. However, it is quite challenging to measure students' performance since this is a product of socio-economic, psychological and environmental factors (Hijazi & Naqvi, 2006). Residential life is a formative part for students of the overall university experience (Coates & Edwards, 2009). Students who live in university residence have advantages over non-residence students in accessing academic services. Residential students can join their classes quickly and can easily access library facilities (Timmons, 2014). They have access to a range of resources that are not available to non-resident students. These resources promote educational outcomes of students (Eisenberg, King, Whitlock, Brower & Inkelas, 2012).

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Non-resident students face several challenges. They have to incur additional costs for renting rooms. In Bangladesh, most students do private tuition to manage high living costs and also share room with a number of roommates. As generally perceived, off campus students are deprived of campus resources that includes computer labs, study lounges, advising services unlike the resident students. Proximity to campus resources such as libraries, advising centers, faculty, classrooms, and staff facilities benefits the students. Residential students, on the other hand, have a large number of peers and ample opportunities to participate in social gatherings within their residential halls or elsewhere on campus. They also have access to support for mental staff and peer counselors (Eisenberg, 2012). It is believed that living in a university residence would enhance student's involvement and educational outcomes as students can acquire range of benefits from living on-campus. The paper will particularly focus on assessing the impact of residential setting (on-campus or off-campus) on the students' performance. In this paper, students' performance is divided into two parts: (1) academic achievement and (2) extra-curricular activities. Academic achievement includes attendance of students, Grade Point Averages (GPAs), and amount of time spent on study. On the other hand, extra-curricular activities include students' involvement in cultural activities, social activities, sports, and other campus activities i.e. events, arts.

Jagannath University is one of the oldest and renowned institutions of Bangladesh. More than 20,000 students are studying in this university. Residential hall is an important feature of a public university. But Jagannath University has no residential hall for students. All students live outside campus by managing their housing privately. The purpose of the study is to show the effect of this accommodation problem on the students' performance to the university authorities. The study has tried to examine the impact of students' housing on their academic performance.

This paper is organized as follows. Background and objective of the study are presented in section 1. Section 2 presents review of relevant literature and the conceptual framework. Section 3 provides methodology of the study. Study findings and discussion are presented in section 4. Section 5 provides recommendations and conclusion of the study.

1.2. Objective of the Study

Students' residences are built for meeting their accommodation needs. In Bangladesh, majority universities have insufficient accommodation setting resulting in a large number of students living off-campus. Some of the universities do not have their own residential halls and therefore all the students have to reside outside the campus. This study is an initiative to investigate the impact of on-campus and off-campus living on students' performance. The general objective of the study is to examine the impact of students' housing on their academic performance; specifically, investigate how their CGPA is affected by the availability of campus resources, residential facilities, percentage of attendance and amount of time spend on study. In addition, the study also focuses on the impact of some socio-economic variables on

students' academic achievement and compares the involvement of on-campus and off-campus students in extra-curricular activities.

1.3. Limitations of the study

This research was not without challenges which might have affected the reliability of the study. It would be more effective to collect more comprehensive information about the housing of students for both universities. The sample selection was purposive and a total of 100 students (50 resident and 50 non-resident students) were selected considering the time and cost related to the study. So there might be significant error in estimation of regression. To get better picture of the housing impact on students' performance, sample should be large. It is expected that further research will address this issue.

2.1. Literature Review

Available research findings indicate that living in university residence halls is positively associated with both academic and social development. Many researchers have found a clear correlation between living in residence hall and academic achievement (Astin, 1973). Education researchers and practitioners are very much interested to identify how campus residential settings affect students' wellbeing, development and success (Eisenberg et al., 2012). Several studies have examined outcomes including academic performance persistence, social and academic involvement, values and attitudes, and cognitive outcomes (Pascarella et al., 1994). Most studies have found that on campus students perform better academically than off-campus living student (Araujo & Murray, 2010)). Most of the students choose to live on-campus as they have greater needs for supportive resources (Eisenberg et al., 2012). Astin's (1984) Involvement Theory implies that students' learning and personal development is directly proportional to the quality and quantity of student involvement in that program. Interactions with peers, faculty and campus administrations are associated with positive outcomes for students. Students-teachers interaction promotes academic achievement, personal growth and development, persistence (Pascarella &Terenzini, 2005).

A supportive campus environment plays an important role in academic success and persistence (Tinto, 2005). Students living on campus have more formal and informal interactions with faculty than their off campus peers (Astin, 1984; Chickering, 1974). Informal interaction of college students and faculty affects students' academic achievement, satisfaction with college, and intellectual and personal development (Halawah, 2006). Chickering (1974) found out that on-campus living had a significant positive effect on completion of the bachelor's degree. Feldman & Newcomb (1969) found that there are positive academic and social effects of living in college or university residence halls.

Astin (1977) found that living on campus increases students' chances for aspiring to attain a graduate or professional degree. Flowers (2004) focused exclusively on African American students and found that living in dormitories positively influenced measures of personal and social development skills. Blimling

(1993) studied on satisfaction of on-campus students and found that on-campus students, particularly those who lived in residence halls, were more satisfied with the university experience than were those who live off campus. Ballou, Reavill, & Schult (1995) found that on-campus life possesses certain advantages over off-campus life in terms of social interaction and positive involvement with peers, faculty, and communities. Good hostel condition and facilities in campus have a positive impact on the overall student enrolment (Bekurs, 2007).

The literature provides support for the positive academic and social effects of residence hall on students' performance (Pascarella & Terenzini, 1991; Feldman & Newcomb, 1969).GPA of a student depends on quiet environment much more rather than time spent on study (Plant, Ericsson, Hill and Asberg, 2005). Students living in residence hall had higher Grade Point Averages, higher retention of grades, and had good interaction with the faculty members on campus (Agron, 1997). Araujo &Murray (2010) had estimated the effect of dormitory living on students' performance. They found that on-campus living increases GPA by 0.19 to 0.97 point. Other studies also found that CGPA of on-campus student increases than students living off-campus as on-campus students can get more benefit from university resources such as computer lab, university clubs, exercise facilities and other extra-curricular activities (Araujo & Murray, 2010; Owolabi, 2015.).

Many researchers have discussed the factors influencing students' choice of residence. Khozaei, Ayub, Hassan & Khozaei (2010) studied on factors predicting student's satisfaction with university hostels in Malaysia and found a significant difference in the satisfaction level between inside-campus and outside campus hostels students.

Rental rates, distance from university, room safety, hostel security, condition of the hostel, hostel population, transport, security, room size and room safety were the most important factors influencing students' satisfaction levels. Further studies revealed that proximity to campus; facilities and amenities, convenience of the room, location and security have influencing impact on students' choice of residence. On-campus living students have a good environment to study while off-campus students tolerate neighborhood and lack quiet environment (Jabar, Yahya, Isnani & Abu 2012).

2.2. Conceptual Framework

Housing is a shelter that can provide basic biological and social processes and permits the healthy growth and development of mind. In one hand, students' dedication is primary requirement to do well in academic performance; in other hand, availability of campus resources is also essential for students' better academic performance. On-campus students feel relaxed about commute, food, security, transportation etc. off-campus students need to rent a house at high cost and face a lot of problems related to it. They suffer from traffic jam, feel unsecured, face financial crisis etc. All these problems affect their academic performance. The researcher considers three factors contributing to Academic achievement: GPA, attendance and hours of study.
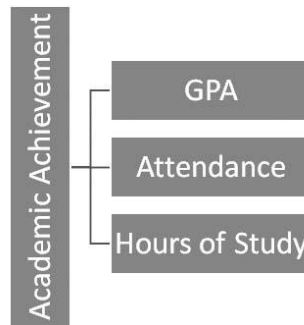
Figure 2.2.1: Factors representing academic achievement.
Generally, Cumulative Grade Point Average (CGPA) is an indicator of students' academic achievement (Gupta & Maksy, 2014). CGPA is the average of all GPA for all semesters or years of a graduate program and higher CGPA indicates better academic performance (Ali, Jusoff, Ali, Mokhtar & Salamat, 2009).

It is deduced that on-campus students can easily attend classes, so percentage of attendance should be high. As their living cost is low they need not to involve in any part time job, so their study hour will be also high and ultimately their CGPA is higher than off-campus students. As they live on-campus, they can easily involve in available extra-curricular activities while off-campus students are unable to do so.

3.0 Methodology

3.1. Target population and research context

The respondents of the study were taken from two public universities: one is Jagannath University, totally non-residential university and another is Jahangirnagar University, totally residential university. The sample of the research is consisted of the master's level students of economics department. This category of students was chosen as they were more experienced to aid in this research and to justify the actual impact of housing on academic performance. That means they were more helpful to analyze the effect of living conditions on a students' academic performance critically.

3.2. Sampling and Data Collection

A sample size of one hundred (100) respondents was purposively selected to represent the population; 50 respondent students from Jagannath University and 50 from Jahangirnagar University. Data for the study was collected using a semi-structured questionnaire which was administered during April-May 2018. Participation of the respondents in the survey was voluntary and they were assured of confidentiality.

3.3. The questionnaire

In the study, questionnaire survey method was followed. Both quantitative and qualitative data were collected from the respondents. The questionnaire consisted of six parts: students' profile, family profile, students' financial statements, family income, factors of academic achievement and extracurricular activities. 5-point likert scale, from 1= "strongly disagree" to 5= "strongly agree" is used in part 5 and 6.

Both open and close ended questions were used in the questionnaire to determine the differences of academic achievement between resident and non-resident students. A pilot study was done to test the reliability and accuracy for removing ambiguity and biasness of the instrument used to collect data. The purpose of the piloting was to identify whether the respondents understood the questions as the researcher has intended them to be understood and whether the respondents answered in the way the researcher expected them to be answered.

4.0 Data Presentation, Analysis and Interpretation

4.1. Background Information of Respondents

4.1.1. Students' profile

Annex Table 1 presents mean value of SSC and HSC results, grade point average, of both resident and non-resident students. For the resident students, mean values of SSC GPA of Science, Arts, and Commerce groups are 4.95, 4.75, and 4.90 respectively. For the non-resident students, mean values of SSC GPA of Science, Arts, and Commerce groups are 4.69, 4.65, and 4.84 respectively. It is seen that mean value of SSC GPA of all three groups for resident students is higher than mean value of SSC GPA of that three groups for non-resident students which is shown in figure 4.1.1.

For the resident students, mean values of HSC GPA of Science, Arts, and Commerce groups are 4.84, 4.92, and 4.88 respectively. For the non-resident students, mean values of HSC GPA of Science, Arts, and Commerce groups are 4.56, 4.77, and 4.75 respectively (refer annex-table 1). All the mean value of HSC GPA of resident students is higher than that of non-resident students (figure 4.1.2). That means, on average, students with higher GPA get chance in residential university (Jahangirnagar University) than non-residential university (Jagannath University).
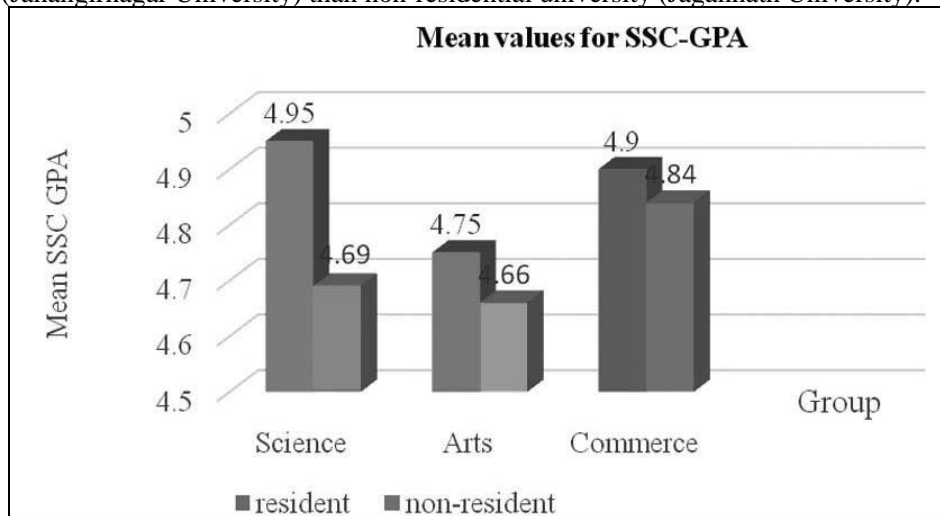

Figure 4.1.1: Group-wise mean values of SSC-GPA for resident and non-resident students.
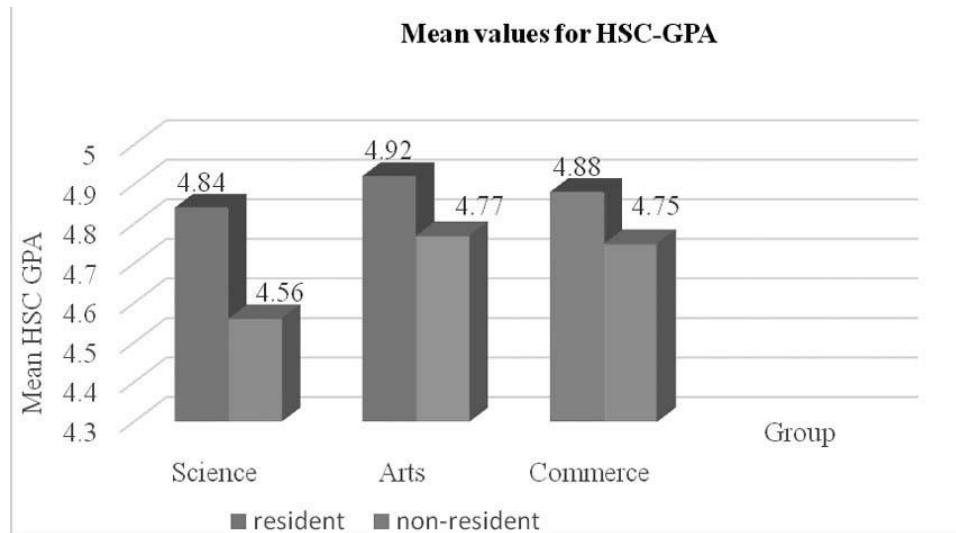
Mean values for HSC-GPA

Figure 4.1.2: Group-wise mean values of HSC-GPA for resident and non-resident students.

4.1.2. Residence

All the students of Jahangirnagar University live in residential halls. On the other hand, Jagannath University is a purely non-residential institution and the students live in 'student-mess' or with relatives or parents. Among the non-resident student, 82% live in 'messes' which are, on average, 3.05 km away from the campus. Remaining 18% of the students live with either 'relatives' or 'parents'. These students have to commute about 8 km every day to attend classes. Traffic situation in Dhaka city, especially in the Jagannath university area, typically poses additional challenges to these students and are likely to affect their performance (Annex Table 2).

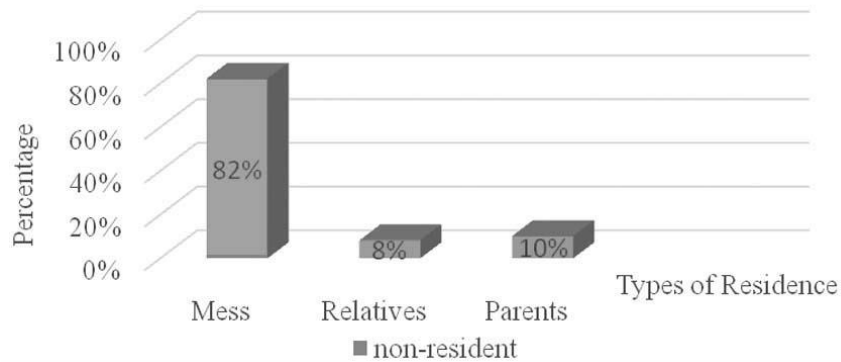**Types of residence for non-resident students (in percentage)**

Figure 4.1.3: Types of residence for non-resident students.

4.1.3.Financial Situation

The survey also collected information on the respondents' financial situation (annual expenditure and annual earning). Mean value of annual expenditure and annual earnings for both resident and non-resident students are taken to show the difference of living cost for two groups of students which must be a matter of concern. In the statistics, it is seen that on average, annual expenditure of a non-resident student is about Tk.27725 more than annual expenditure of a resident student. On the other hand, annual earning of a non-resident student is also higher than a resident student by the amount Tk. 27411, on average.

Table 4.1.1. Students' financial statement

Residential status	Mean (Annual expenditure in Tk.)	Mean (Annul earning in Tk.)
Resident	78634	89562
Non-resident	106359	116973

Source: Researcher's own calculation based on Student survey, 2018

Table 4.1.1presents that for both group of students, annual earning (earning source: family & tuition/part time job) is higher than annual expenditure.

The survey reveals that a student manages his/her living expenditure typically from two sources: family income and tuition or part time job. That means they get a portion (or total) of their expenses from family and a portion from tuition or part time job. Annex table 3 presents the mean of tuition earning and family support. From table, it is clear that earning of non-resident students is more than that of resident students by the amount Tk. 24368 annually, on average. That means, non-resident students do tuition more than resident students proportionally. On the other hand, non-resident students also take more support from their family by the amount Tk. 7207 annually, on average.

For Non-resident students, about 52% of total annual earning for annual living and educational expenses comes from tuition income and 46% comes from family support (remaining 2% from other source i.e. relatives). For resident students, on the other hand, only 40% of total annual earning for annual living and educational expenses comes from tuition income and 53% comes from family support (7% from relatives).

The survey reveals that about 78 percent non-resident students do tuition while only 62 percent resident students (annex table 4). This indicates how much time non-resident students spend by doing tuition to manage their high living cost rather than involving in academic study and other extra-curricular activities.
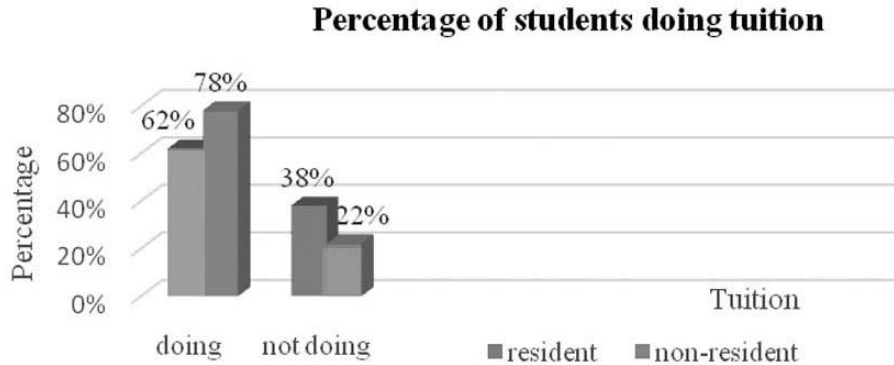
Figure 4.1.4: Percentage of resident and non-resident students doing tuition.

Annex Table 5 presents the mean value of rent and education expenses and also the percentage of those expenses in terms of annual total expenditure of respondent. The difference of expenditures on rent and educational expenses between the resident and non-resident students is clear from the table. Non-resident students have to spend a large sum of money on privately arranged residence, about 24 percent of their annual total expenditure. A resident student, on other hand, spends only Tk. 244 for residence of total annual expenditure, 0.31 percent.

The annual educational expense of a non-resident student is more than double than that of a resident student. For resident students, annual educational expenses is Tk.9198 on average which is only 12 percent of their annual total expenditure while a non-resident student has to spend 19 percent of annual total expenditure. This reveals that how non-resident students are facing financial crisis in completing their graduation from a non-residential institution.
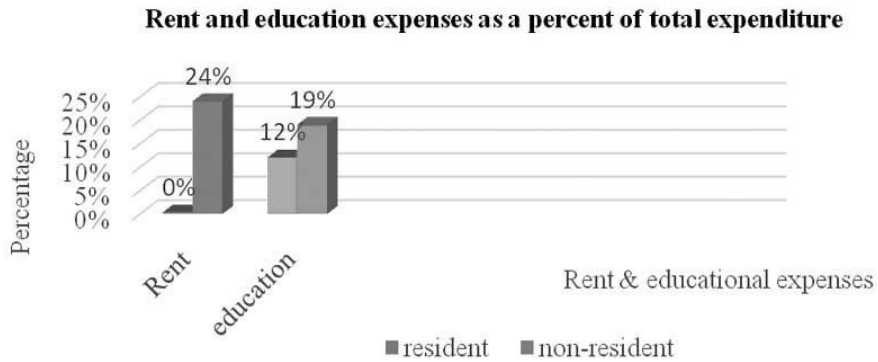
Figure 4.1.5: Rent and education expenses for resident and non-resident students as a percent of total expenditure.

The study finds that on-campus students achieve better CGPA than off-campus students. The mean CGPA for resident students is 3.39 and for non-resident students is 3.23. Class attendance and amount of time spent on studies are assumed to contribute to achieving better results in the examinations. Accordingly, resident students are expected to have greater opportunity to attend classes and higher study hours.

Interestingly, non-resident students' average class attendance is higher (96 percent) than that of the resident students (87 percent). But the resident students spend more time on studies (1241.2 hours) compared to the non-resident students (1091.73 hours).

Table 4.1.2. Results, Attendance and Hours of Study

Residential status	CGPA		Attendance		Hours of Study	
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
Resident	3.395	.0398643	87.02	1.295357	1241.2	101.9714
Non-resident	3.2318	.025891	95.78	.8515334	1091.73	87.36215

Source: Researcher's own calculation based on Student survey, 2018

From table 4.1.2, it is seen that on-campus students' academic achievement (CGPA) is better than off-campus students.

T test:

The t-test compares two means of CGPA for resident and non-resident students and tells how significant the differences are. Table 4.1.3 presents the result of t-test about the CGPA of resident and non-resident students.

Table 4.1.3: Paired sample t- test regarding CGPA of resident and non-resident students

Residential status	Mean (CGPA)	N	Std. Dev.	t-value	df	p-value
Resident	3.395	50	.28188	3.554	49	.001
Non-resident	3.2318	50	.18308			

Source: Researcher's own calculation based on Student survey, 2018

It is found that the difference between the mean values of two groups of students is .16320. From paired sample test, the analysis found t(49)=3.554 and p= .001 indicating the highly significant differences between mean CGPA of resident students and mean CGPA of non-resident students. That means, the mean difference between CGPA of resident and non-resident students (.16320) is highly significant even at 1% level of significance revealing the impact of residence on academic achievement of students.

4.1.4. Factors contributing to academic achievement

The study has tried to identify the list of major factors responsible for better CGPA of resident/on-campus students through a set of statements and assessed using 5-point Likert scale from "1= strongly disagree" to "5= strongly agree". In annex table 6, mean values of students' perception on statements contributing to academic achievement are given.

Mean value for the statement of getting more time due to low living cost for resident students is 3.72 implying that they agree to this statement. Similarly, resident students agree with that less mental pressure about financial crisis and availability of campus resources help to improving academic achievement. In addition, resident students enjoy low cost food at the hall cafeteria.

Greater connectivity with peers along with proximity to lab, library, internet facilities, provide them with greater access to their required study materials. Saving

commuting time is also an important benefit that resident students enjoy. All these, however, contribute significantly to better academic achievement of the resident students in comparison with their non-resident counterparts. Mean values of the responses for the statements on factors that might potentially contribute to the academic achievement of resident and non-resident students are given in annex table 6. The following bar diagram represents those mean values with respective statements (figure 4.1.6).

Factors contributing to academic achievement of resident students
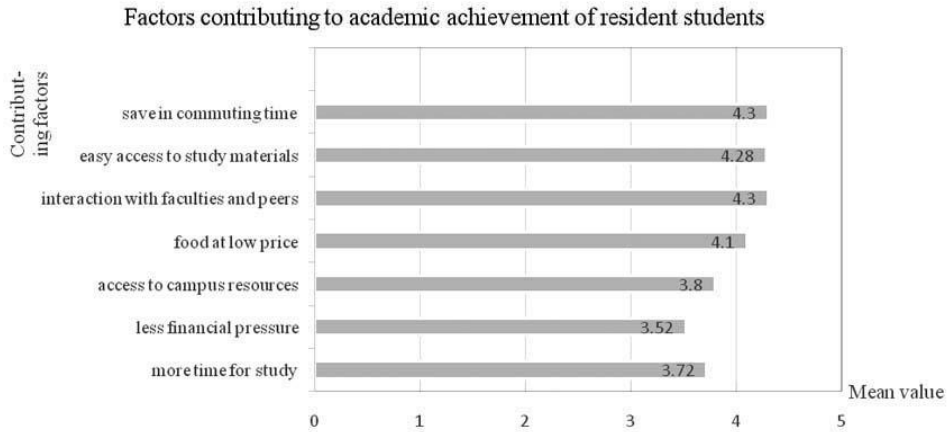
Figure 4.1.6: mean of factors contributing to academic achievement of resident students.

Non-resident students mentioned some positive sides to live with parents, relatives and messes rather than university residence. They enjoy somehow hygienic environment and healthy food, can share their room with chosen one and can enjoy flexibility in the increasing of needed facilities or can avoid worse one. Non-resident students revealed their opinion in 5-point likeart scale. Mean values for those responses of statements against factor contributing to academic achievement of non-resident students are shown in the following diagram (figure 4.1.7).

Factors contributing to academic achievement of non-resident students
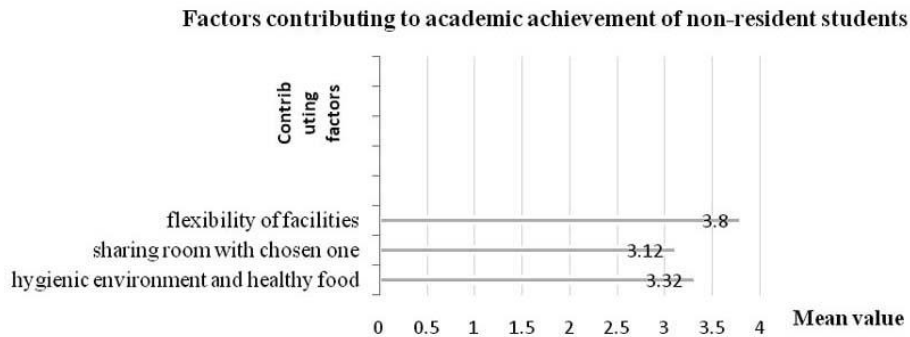
Figure 4.1.7: Mean of factors contributing to academic achievement of non-resident students.

4.1.5. Factors affecting academic achievement:

Resident students expressed concern about poor food quality, drug use and smoking. On the other hand, non-resident students raised strong concern about a number of factors that negatively affect their academic achievement. These issues include high living costs in private housing, high commuting time and cost. Living off-campus also is a major barrier to accessing study materials and resources, as well as benefiting from connectivity with peers and faculties. In addition, sharing rooms with individuals from other institutions or profession hampers academic environment and generate sense of insecurity that have negative implications on students' academic performance (e.g. CGPA).

Factors affecting academic achievement of resident students

Factor	Mean value
room sharing with a number of..	2.88
drugs and smoking	3.18
ragging	2.28
political pressure	2.32
unhygienic residency	2.86
poor food quality	3.88

Figure 4.1.8: Mean of factors affecting academic achievement of resident students.

Mean values of the responses for the statements on factors that might potentially affect academic achievement of resident and non-resident students are given in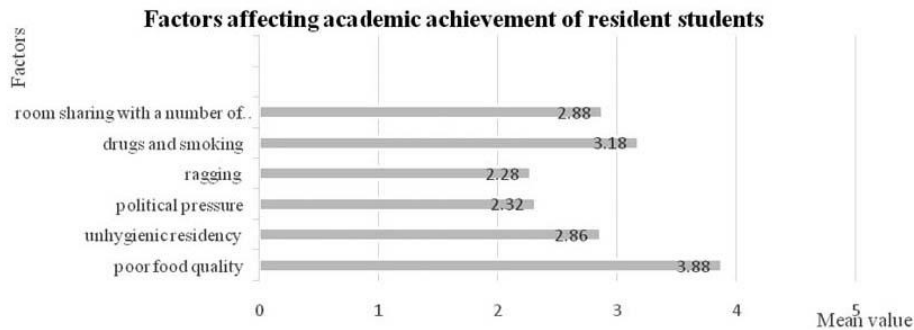 annex table 7. Mean values with respective statements are shown in the following bar diagram (figure 4.1.8 and figure 4.1.9).

Factors affecting academic achievement of non-resident students

Factor	Mean value
lack of discipline	3.92
room sharing with students of other..	3.9
insecurity	3.68
poor connectivity with faculties and peers	4.12
commuting time and cost	4.34
less access to campus resources	3.96
tuition/part time job	4.54
high living cost	4.6
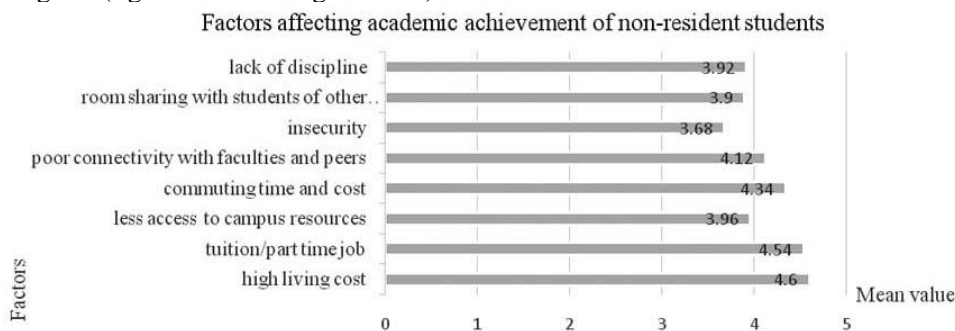
Figure 4.1.9: Mean of factors affecting academic achievement of non-resident students.

4.2. Extra-curricular Activities

Students' involvement in extra-curricular activities is associated with several positive outcomes at personal, institutional, and social levels. Some of the expected outcomes include better grades, lesser drop-out rates, greater educational attainment, improved institutional image, empathy and belongingness to society. Current study focused on this aspect and made an attempt to find out if residence status can affect students' involvement in any type of extra-curricular activities. Annex table 8 presents list of

extra-curricular activities along with the frequency of students interested in those activities. Both resident and non-resident students demonstrate their interest in different types of sports, debates, and cultural activities. Interestingly, a large proportion of non-resident students expressed their interest in activities that directly benefit the society.

However, the study reveals (Annex table 9) that opportunities to accessing extra-curricular activities need to be improved. Also, non-resident students have lower access to these opportunities compared to their resident counterparts. Non-resident students face more constraints to accessing those extra-curricular activities which include lack of facilities, lack of time available, distance from their place of residence to those activities, financial crisis.
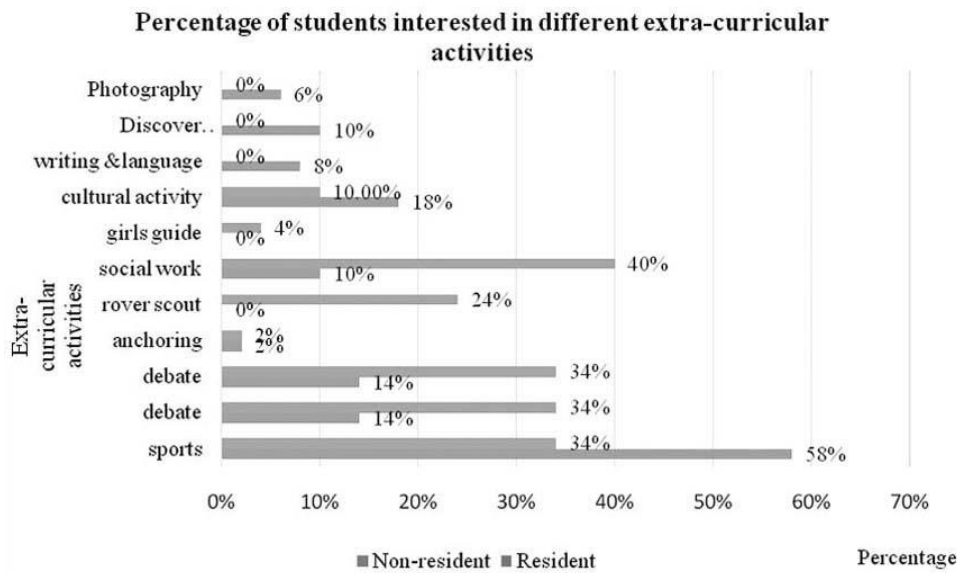

Percentage of students interested in different extra-curricular activities

Figure 4.2.1: percentage of resident and non-resident students interested in different extra-curricular activities.

These activities are more accessible for resident students compared to non-resident students. The mean value of extent of the accessibility of extra-curricular activities to resident students is 3.94 while the mean value for non-resident students is 3.38 (annex table 9). The difference between the mean values of extra-curricular activities between two groups of students is 0.56. From paired sample test (annex table 10), the analysis found $t(98) = 20.1516$ and $p = .000$ indicating highly significant differences between resident students and non-resident students in terms of level of accessibility of extra-curricular activities.

Annex table 11 shows all those constraints faced by students to involve in extra-curricular activities. Many of respondents from non-resident group mention lack of time as a major constraint for them to attend non-academic performance. Distance of living place from campus, transportation and high living cost are major bindings for off-campus students. On the other hand, resident students mention i. lack of willingness ii. fund deficit for those activities iii. communication gap among students involving in those activities, as their major constraints to involve in extra-curricular

activities. Both groups of respondents mention study pressure and limited scope as constraints in this case.

Constraints to extra-curricular activities
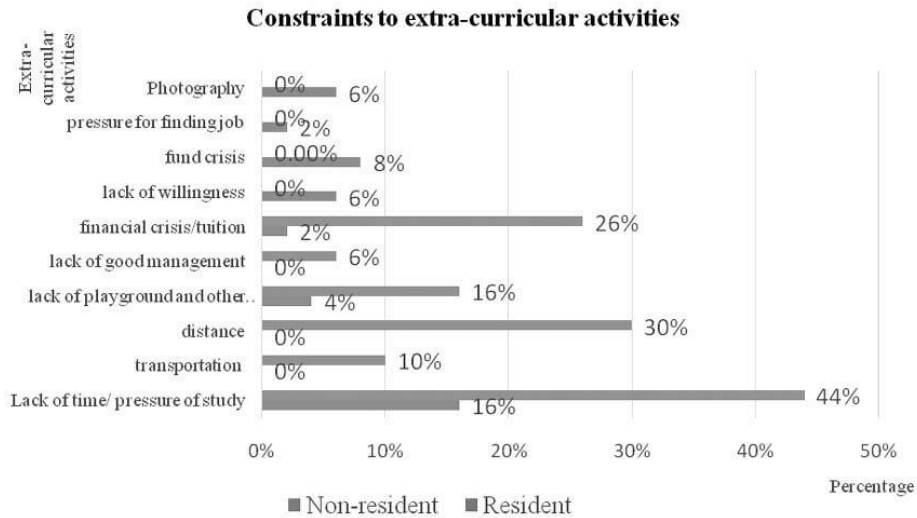
Figure 4.2.2: Constraints to extra-curricular activities for resident and non-resident students.

Annex Table 12 presents recommendations for increasing students' participation in extra-curricular activities. Over 30 percent of the students living on-campus mentioned that proper motivation is imperative for involving in extra-curricular activities. A large proportion of them also mentioned the need for funding for increasing participation. On the other hand, about 40 percent of the non-resident students mentioned that 'residence' facility could significantly improve the situation (figure 4.2.3). Like   the resident students, non-residents also think that proper 'motivation' could also contribute significantly in having more students in extra-curricular activities. Other measures include increased opportunities, departmental influence, awareness about programmes, and increased amount of facilities.

Recommendation to increase participation in extra-curricular activities

Figure 4.2.3: Recommendation by resident and non-resident students to increase participation in extra-curricular activities.

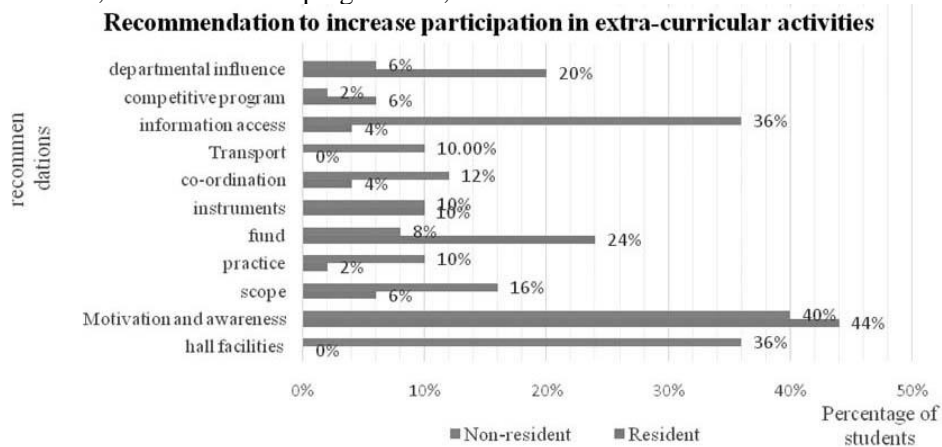Respondents added some remarks against an open ended question. They have given their opinion to improve students' academic performance: i. Academic achievement and ii. Extra-curricular activities. 33 non-resident respondents (66%) have required hall facilities to increase their academic performance (annex table 13). They also need better infrastructure, transport, improved education quality, teachers' cooperation and library facilities etc. Resident students have required good food quality, session jot reduction, technological improvement, and opportunity of scholarship etc.
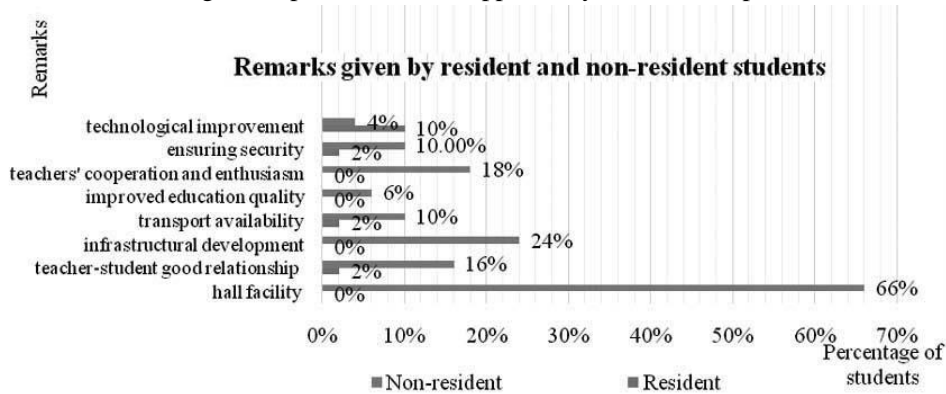
Figure 4.2.4: Remarks given by resident and non-resident students.

Few important remarks given by non-resident students to improve their academic performance are presented in figure 4.2.4.

4.3. Econometric Analysis

4.3.1. The Model

In the regression model of the study, academic achievement (CGPA) is regressed on the students' resident, gender, tuition, SSC result of the student, HSC result of the student, annual expenditure of the student, annual family income, annual study hour and average attendance in BSS/BSc. The following econometric model has been applied to estimate the coefficient of the regressors in the study.

$$Y_i = \beta_1 + \beta_2 D_{2i} + \beta_3 D_{3i} + \beta_4 D_{4i} + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + u_i$$

The variables of the model are defined as follows:

Y_i = CGPA

D_{2i} = 0 for non-residential students and 1 for residential students

D_{3i} = 0 for male students and 1 for female students.

D_{4i} = a dummy variable taking a value of 0 for students who has no tuition income

X_5 = SSC result of the students

X_6 = HSC result of the students

X_7 = annual expenditure of the students

X_8 = annual family income

X_9 = annual study hour

X_{10} = average attendance in BSS/BSc and

u_i = random error term.

The β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, β_9, and β_{10} represent the impact of residential status, gender, tuition, secondary result, higher secondary result, annual expenditure, annual family income, annual study hour, and average attendance in undergraduate level on cumulative grade point average.

4.3.2. Analysis and estimation:

Our analysis is statistical and the statistical analysis used in the study is linear regression analysis. The analysis is intended to determine which factors (students 'resident, gender, tuition, SSC result of the student, HSC result of the student, annual expenditure of the student, annual family income, annual study hour and average attendance in BSS/BSc) explain the most variation in dependent variable (CGPA). Using popular econometric software STATA, we have obtained all the estimation.

4.3.3.Regression Analysis

Table 4.3.1:Parameter Estimates:

Y_i	Coef.	Std. Err.	T	P>|t|	95% Conf. Interval	
D_{2i}	.2480026	.0522389	4.75	0.000	.144221	.3517842
D_{3i}	.0782075	.04782	1.64	0.105	-.0167953	.1732104
D_{4i}	.0108448	.0476091	0.23	0.820	-.0837391	.1054286
X_5	.104817	.0717832	1.46	0.148	-.0377929	.2474269
X_6	.0062187	.0758476	0.08	0.935	-.1444659	.1569033
X_7	5.21e-07	4.60e-07	1.13	0.261	-3.94e-07	1.43e-06
X_8	1.01e-07	5.54e-08	1.82	0.071	-8.97e-09	2.11e-07
X_9	.0000523	.0000338	1.54	0.126	-.000015	.0001195
X_{10}	.0116518	.0030473	3.82	0.000	.0055979	.0177057
_cons	1.408635	.5012273	2.81	0.006	.4128591	2.40441

Number of observation	100
F (5,144)	6.26
P > F	0.0000
R-squared	0.3849
Adj R-squared	0.3234
Root MSE	0.20587

Source: Researcher's own estimation based on Student survey, 2018

Table 4.3.1 presents the results of regression analysis. Coefficient of D_{2i} (residence-dummy) is .248 representing that for every unit increase in residency we expect a .248-unit increase in the CGPA holding all other variables constant. As residency is coded 1, for resident students the predicted CGPA would be .248 points higher than for non-resident students. The t value of this coefficient is 4.75.The p value of observed t statistics is 0.000 which is less than fixed 5% level of significance. So the relationship between students' resident and academic performance is highly significant and we can say that off-campus students' academic performance can be improved by 25% if they live in on-campus. This implies that availability of campus resources, more interaction with faculties, peering and other facilities have a great impact on the students' performance.

In the study, gender is used as a categorical variable to account for differences in academic success rates between sexes (male-0, female-1). The coefficient of D_{3i} (.0782) indicate an insignificant but positive relationship between gender and academic performance (p value- .105). It is generally thought that students engaged in private tuition cannot attend classes on time; spend less time in the home for study reason. But our study finds that tuition income has an insignificant positive impact on CGPA.

SSC and HSC results were used to measure students' cognitive abilities. These variables indicate whether academic performance in university can be predicted by the high school and secondary school level academic success of a student. But in our study, we see that secondary and higher secondary results have an insignificant positive (as p values of both variables are higher than 5% level of significance) impact on undergraduate results and these are not dominant factors in determining good results in university level. The study also found that students' annual expenditure has very insignificant positive impact on CGPA.

The variable X_8 (family income) is significant at 10% level of significance that means family income has a significant positive impact on CGPA. We can deduce that rich students can maintain better CGPA due to having a good environment (IT facilities, refreshment, etc), good food combination and nutritious food, the social status of parents and taking care of parents of the rich family. Since poor students have to earn a part of their living expenses by involving in different activities like taking classes in coaching center, have to do tuition or any kind of part-time work and can spend less time in both academic and non-academic activities in perspective of Bangladesh.

It is surprising that study hour has an insignificant positive impact on CGPA where average attendance has a significant positive impact on academic performance: for every unit increase in average attendance, CGPA would increase by .0116 points. This indicates that the class lecture is very much effective for a student to do well in academic results.

Variance Inflation Factor (VIF) is estimated to test multicolinearity and the Breusch-Pagan test is used to test for heteroskedasticity in a linear regression model. VIF is less than 5 for each variable, so there is no correlation among variables and that's why no presence of multicoliniearity (Annex table 14). The null hypothesis (homoscedasticity) is accepted in the Breusch-Pagan test. So, there is also no heteroskedasticity (Annex table 15).

5. Findings of the Study
Following are the key findings of the study

- Living cost of non-resident students is much higher than the resident students as non-resident students' house rent and education expenses are high. For this, they have to commit in tuition or part time job (78%) to meet higher expenses and so they get less time for studying.
- Non-resident students need more family support. They spend 15% of annual income of their family, on average, while their annual family income is less than resident students' annual family income.
- On average, off-campus students' academic achievement (CGPA) is less than on-campus students by 0.16 point indicating highly significant difference between CGPA of resident and non-resident students.

- Off-campus students get less time to study but they are more regular in their classes as their average annual attendance is more than on-campus students.
- Lower cost of living, more access to campus resources, less financial pressure, more interactions with faculties and peers, and proximity to campus have great influence on academic achievement of resident students. Poor food quality of halls, uses of drugs and smoking hamper academic achievement of resident students. On the other hand, high living cost, limited access to campus resources, commuting time and cost, poor interaction with faculties and peers affects academic achievement of non-resident students. The finding indicates significant relationship between residents and academic achievement of students.
- Gender, tuition, SSC and HSC results, students' annual expenditure and study hour have insignificant positive impact on academic achievement of students. But family income and average annual attendance have significant positive impact on academic achievement of students.

    Overall, academic performance of students is mostly affected by resident type and some socio-economic factors.

6.0 Recommendations and Conclusion
6.1. Recommendations
Residence type plays a major role on the academic achievements of students as the study indicates that the students can achieve better academic performance if they stay in campus residence. Non-resident students, as for example students of Jagannath University, are facing acute housing crisis, which is affecting their academic activities. A large amount of money is spent on house rent which is really distressing for the student's of public universities. In the line with the findings, the study gives the following recommendations

- If a public university wants to build and maintain its reputation as a place of academic excellence and research, it should build sufficient number of halls for the students. So Jagannath University authority should care about this acute housing problem of the university. Students of the University should be provided with residence hall as early as possible. Otherwise, in future students of the university will face a great deal of difficulty as house rent is increasing frequently.
- The government through the university authority and private investors should provide affordable halls with adequate facilities to accommodate students of Jagannath University. Government should allocate enough budgets for this public university with handsome amount for residential hall for the students.
- Based on findings, it is recommended that management of the resident university (Jhangirnagar University) should improve facilities of various halls and extra-curricular activities to enhance overall performance of students.

6.2. Conclusion

The study investigated the impact of students' housing and factors influencing the academic achievement of university students. To conclude, the main finding of the study is that resident students have good academic performance than non-resident students. Non-resident students, particularly students of Jagannath University, showed poor academic excellence than resident students, students of Jahangirnagar University, especially for the housing problem. Students have to pay a large portion of monthly expenditure on housing and for this reason many of them are not able to enjoy desired standard of living. Although students of Jagannath University are starting to show better performance in many cases, the solution of this housing problem as a priority become a crying need for students to do better in academic performance. From the findings it is recommended that Jagannath University authority should solve this housing problem on a priority basis. Also the government should consider this housing issue of Jagannath University seriously. Therefore, the findings of this study may be considered by the university management in their attempt to provide the residential hall to the students of the university.

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Annexes

Annex Table 1: Group-wise mean values of SSC and HSC results (GPA)

Residential status	Division	Mean (SSC-GPA)	Mean (HSC-GPA)
Resident students	Science	4.95	4.84
	Arts	4.75	4.92
	Commerce	4.90	4.88
Non-resident students	Science	4.69	4.56
	Arts	4.66	4.77
	commerce	4.84	4.75

Source: Researchers' own calculation based on Student Survey data, 2018

Annex Table 2: Types of residence and distance from campus for non-resident students:

Types of residence	Frequency	Percentage	mean(distance)
Mess	41	82%	3.05
Relatives	4	8%	11.5
Parents	5	10%	4.7

Source: Student survey, 2018

Annex Table 3. Students' earning source (tuition and family):

Residential status	Tuition		Family	
	Mean	Percentage of total income	Mean	Percentage of total income
Resident	35960	40%	47301.6	53%
Non-resident	60328	52%	54508.8	46%

Source: Researcher's own calculation based on Student survey, 2018

Annex Table 4: Frequency and percentage of students doing tuition:

Residential status	Tuition (frequency)			
	Doing	percentage	Not-doing	percentage
Resident	31	62%	19	38%
Non-resident	39	78%	11	22%

Source: Student survey, 2018

Annex Table 5: Rent and education expenses as a percent of total expenditure:

Residential Status	Rent		Education	
	Mean	Total expenditure (%)	Mean	Total expenditure (%)
Resident	244.8	0.31%	9198	12%
Non-resident	26155.2	24%	20156	19%

Source: Researcher's own calculation based on Student survey, 20

Annex Table 6: Factors contributing academic achievement:

Residential Status	Sl.	Statements	mean
Resident	1.	I get more time for study due to low living cost	3.72
	2.	I have less mental stress about financing my monthly expenses	3.52
	3.	Campus resources (library, computer lab, broadband, WiFi etc.) help improve my academic achievement.	3.8
	4.	Availability of food at low price reduce my financial pressure	4.1
	5.	I can easily get connected with faculties and peers due to living in university residence	4.3
	6.	Easy access to study materials (books, notes from seniors etc.) help improve my academic achievement.	4.28
	7.	I can save commuting time due to staying in university residence	4.3
Non-resident	1.	I enjoy hygienic environment and healthy food.	3.32
	2.	I have chance to share my room with chosen one.	3.12
	3.	Flexibility in adding and subtracting facilities in my resident.	3.28

Annex Table 7: Factors affecting academic achievement:

Residential status	Sl.	Statements	mean
Resident	1.	Poor food quality is affecting my health.	3.88
	2.	Unhygienic residency (unclean room and bathroom) affect my health.	2.86
	3.	Political pressure hamper my study.	2.32
	4.	In my resident ragging affects me mentally	2.28
	5.	Use of drugs and smoking in residency is an important issue in the university residence	3.18
	6.	Room sharing with a number of students affect my studies	2.88
Non-resident	1.	High living cost in private housing is a major challenge for me.	4.6
	2.	High living cost forces me to do tuition/part time job which affects my academic achievement.	4.54
	3.	Less access to campus resources (library, computer lab, broadband, WiFietc) hamper my academic achievement.	3.96
	4.	Commuting time and cost affects my academic achievement.	4.34
	5.	Poor connectivity with faculties and peers hampers my academic performance.	4.12
	6.	I feel in-secured in my living place which affect my study.	3.68
	7.	Room sharing with students of another institution/other profession affect academic performance.	3.9
	8.	Lack of discipline among the roommates affect my academic achievement.	3.92

Source: Researcher's own calculation based on Student survey, 2018

Annex Table 8: Percentage of students interested in different extra-curricular activities

Sl.	Extra-curricular Activities	percentage	
		Resident	Non-resident
1.	sports	58%	34%
2.	debate	14%	34%
3.	anchoring	2%	2%
4.	rover scout	0%	24%
5.	social work	10%	40%
6.	girls guide	0%	4%
7.	cultural activity	18%	10%
8.	writing &language	8%	0%
9.	Discover Bangladesh	10%	0%
10.	Photography	6%	0%

.Source: Researcher's own calculation based on Student survey, 2018

Annex table 9. Accessibility to extra-curricular activities:

Residential status		Mean
Resident	To what extent these activities are accessible to you?	3.94
Non-resident	To what extent these activities are accessible to you?	3.38

Source: Researcher's own calculation based on Student survey, 2018

Annex table 10: paired sample t- test regarding accessibility of extra-curricular activities.

Residential status	Mean (CGPA)	N	t-value	p-value
Resident	3.94	50	20.1516	.000
Non-resident	3.38	50		

Source: Researcher's own calculation based on Student survey, 2018

Annex Table 11: Constraints to accessing those extra-curricular activities:

Sl.	Constraints	Percentage	
		Resident	Non-resident
1.	Lack of time/ pressure of study	16%	44%
2.	transportation	0%	10%
3.	distance	0%	30%
4.	lack of playground and other instrument	4%	16%
5.	lack of good management	0%	6%
6.	financial crisis/tuition	2%	26%
7.	lack of willingness	6%	0%
8.	fund crisis	8%	0%
9.	pressure for finding job	2%	0%
10.	unacceptance of society as a female	2%	0%

Source: Student survey, 2018

Annex table 12: Recommendation to increase participation in extra-curricular activities:

Sl.	Recommendation	percenstage	
		Resident	Non-resident
1.	Hall facilities	0%	36%
2.	Motivation and awareness	44%	40%
3.	Scope	6%	16%
4.	Practice	2%	10%
5.	Fund	24%	8%
6.	Instruments	10%	10%
7.	Co-ordination	4%	12%
8.	Transport	0%	10%
9.	Information access	4%	36%
10.	Competitive program	6%	2%
11.	Departmental influence	20%	6%

Source: Student survey, 2018

Annex Table 13: Remarks given by respondents:

Sl.	Remarks	percentage	
		Resident	**Non-resident**
1.	hall facility	0%	66%
2.	good relation among teachers and students	2%	16%
3.	infrastructural development	0%	24%
5.	Connectivity	4%	6%
6.	transport availability	2%	10%
7.	improved education quality	0%	6%
8.	teachers' cooperation and enthusiasm	0%	18%
9.	ensuring security	2%	10%
10.	students' unity	4%	6%
11.	library facility	2%	6%
12.	good food quality	2%	0%
13.	adequate facilities for all students	6%	4%
14.	group work practice	2%	2%
15.	session jot reduction	2%	0%
16.	strict rules to discourage smoking and drinking	2%	0%
17.	healthy relation among all teachers	2%	0%
18.	opportunity of scholarship	2%	2%
19.	maintenance of visitors	4%	0%
20.	technological improvement	10%	4%
21.	soft skill development program	2%	0%

Source: Researcher's own calculation based on Student survey, 2018

Annex Table 14: Variance Inflation Factors (VIF):

Variable	VIF	1/VIF
D_{2i}	1.61	0.620556
D_{3i}	1.21	0.826035
D_{4i}	1.12	0.891516
X_5	1.29	0.777815
X_6	1.29	0.773213
X_7	1.12	0.891427
X_8	1.14	0.876343
X_9	1.21	0.825274
X_{10}	1.71	0.585031

Source: Researcher's own calculation based on Student survey, 2018

Annex Table 15: Breusch-Pagan test for Heteroskedasticity:

$Chi^2 (1)$	0.38
Prob	0.5401

Source: Researcher's own calculation based on Student survey, 2018